

CLAIMS

1. A stator for an electric motor, comprising:
 - a) a radial array of $2N$ teeth, definable as 1, 2, 3, to $2N$;
 - b) N coils, one wound around each even tooth; and
 - c) no coil wound around any odd tooth.

2. A stator for an electric motor, comprising:
 - a) a first group of stator teeth, each
 - i) acting as magnetic core for a single coil wound around it; and
 - ii) carrying substantially all magnetic flux of the coil wound around it;
 - b) a second group of stator teeth, having no coils wound around them.

3. Stator according to claim 2, wherein slots are present between adjacent teeth, and some slots contain no coils.

4. A stator for an electric motor, comprising:
 - a) a radial array of stator teeth, separated by stator slots; and
 - b) phase coils encircling at least some stator teeth, wherein no slot contains coils from more than one phase.

5. Stator according to claim 4, wherein the radial array of stator teeth comprises at least two teeth.

6. Apparatus, comprising:
 - a) a stator for an electric motor, comprising coil slots; and
 - b) in any slot, no coils from more than a single phase.

7. Apparatus, comprising:

- a) a stator for an electric motor, comprising coil slots;
- b) a rotor;
- c) coils in respective slots,

wherein all currents in any slot are in-phase.

8. Apparatus according to claim 7, wherein no currents in any slot have different phases.

9. Apparatus according to claim 1, and further comprising a motor vehicle which powers the motor.

10. Apparatus according to claim 5, and further comprising a motor vehicle which powers the motor.

11. Apparatus according to claim 7, and further comprising a motor vehicle which powers the motor.

12. A stator for an electric motor, comprising:

- a) an outer rim;
- b) stator teeth extending radially inward from the rim;
- c) breaks in the stator, which allow
 - i) individual stator teeth to be removed from the stator; and
 - ii) a pre-formed coil to be mounted onto selected stator teeth.

13. A stator for an electric motor, comprising:

- a) a radial array of stator teeth, with a stator slot present between adjacent pairs of teeth;
- b) a rim surrounding the teeth; and
- c) breaks in the rim, teeth, or both, which allow
 - i) individual teeth to be separated from the stator and
 - ii) a pre-formed coil to be inserted onto selected individual teeth.

14. Stator according to claim 13, wherein structural configuration of the removed stator teeth does not require deformation of the pre-formed coil during mounting.

15. Stator according to claim 13, wherein structural configuration of the removed stator teeth does not require deformation of the pre-formed coil during insertion.

16. A collection of parts for constructing a stator for an electric motor, comprising:

- a) a plurality of pre-formed coils;
- b) a first set of stator teeth having radially outer ends which fit into the pre-formed coils; and
- c) a second set of stator teeth, each having a segment of a rim mounted thereon.

17. Collection according to claim 16, wherein a radial array of stator teeth connected to an outer rim is generated when

- i) the first set of stator teeth is positioned in odd-numbered sectors of a circle, and
- ii) the second set of stator teeth is positioned in even-numbered sectors of the circle.

18. Collection according to claim 17, wherein the segments of the rim collectively form a circular periphery of the stator.

19. Collection according to claim 17, wherein the segments of the rim, together with radially outer sections of stator teeth in the first set, collectively form a circular periphery of the stator.

20. A stator for an electric motor, comprising:

- a) a radial array of stator teeth, extending inwardly from a circumferential rim;
- b) breaks in the rim, teeth, or both, which allow
 - i) individual teeth to be separated from the stator and
 - ii) a pre-formed coil to be inserted onto selected individual teeth.

21. Stator according to claim 20, wherein parts of the rim are connected to some teeth when removed, preventing insertion of pre-formed coils onto such teeth.

22. A stator for an electric motor, comprising:

- a) an outer rim;
- b) stator teeth extending radially inward from the rim;
- c) breaks in the rim, which define the stator teeth into two groups wherein:
 - i) in one group, each tooth has a radially outward end over which a stator coil can be inserted;
 - ii) in the second group, each tooth has a radially outward end connected to a segment of the circular rim.

23. Stator according to claim 22, and further comprising

- d) coils around teeth in the first group; and
- e) no coils around any teeth in the second group.

24. Stator according to claim 22, wherein every tooth bears a pole face on its radially inward end.

25. A method of constructing a stator for an electric motor, comprising:

- a) forming coils, each having a hollow core;
- b) placing a stator tooth in the hollow core of each coil;
- c) connecting ends of the stator teeth with arcuate segments to thereby form a circular rim having coil-bearing stator teeth extending radially inward therefrom.

26. Method according to claim 25, wherein each stator tooth has a pole face on one end.

27. Method according to claim 25, wherein the pole face blocks removal of a coil past the pole face.

28. A method of constructing a stator for an electric motor, comprising:

- a) forming N coils, each having a hollow core;
- b) providing a radial array of 2N stator teeth such that
 - i) teeth in odd-numbered positions are surrounded by coils; and
 - ii) teeth in even-numbered positions are surrounded by no coils.

29. A method of constructing a stator for an electric motor, comprising:

- a) forming a group of generally T-shaped structures, each comprising a stem and a bar, with
 - i) the bar being arcuate, and
 - ii) the stem located on the concave side of the arcuate bar;
- b) forming a group of N stator teeth, each having a radially outward end;
- c) forming N coils, each having a hollow core;
- d) placing one stator tooth into the hollow core of each stator tooth;
- e) placing no coils on any stems;
- f) assembling the T-shaped structures, the N coils, and the N stator teeth into a stator.

30. Method according to claim 29, and further comprising placing the stator into a motor vehicle.

31. Apparatus according to claim 1, wherein the coils provide multiple phases.

32. Method of constructing a stator for an electric motor, comprising:

- a) inserting pre-wound coils, each having a core, onto stator teeth carried by stator sections;
- b) assembling the stator sections into a stator, wherein
 - i) junctions between stator sections are present, and
 - ii) a continuous loop exists around at least one coil, which loop (1) passes through said core and (2) crosses no more than a single junction.

33. Method according to claim 32, wherein a continuous loop exists around every coil, which loop (1) passes through said core and (2) crosses no more than a single junction.

34. Method of constructing a stator for an electric motor, comprising:

- c) inserting pre-wound coils, each having a core, onto stator teeth carried by stator sections;
- d) assembling the stator sections into a stator, wherein
 - i) junctions are present between stator sections, and
 - ii) a path exists for flux lines generated by a coil to follow, which path crosses only one junction.

35. Method according to claim 34, wherein a path exists for every coil, which flux lines can follow, and which crosses only a single junction.

36. Apparatus, comprising:

- e) a collection of coils;
- f) a group of parts which, together with some of the coils, can be assembled into stators for electric motors, which have coils mounted on stator teeth, wherein (1) junctions exist in the stator, between adjacent parts, and (2) for at least one coil, a path exists which crosses no more than one junction, which flux lines generated by the coil can follow.

37. Apparatus according to claim 36, wherein a path crossing no more than a single junction is available for magnetic flux lines generated by every coil.